

December 29, 2003

ANALYSIS APPARATUS

FIELD OF THE INVENTION

This invention relates to an analyzer for determining the concentration of one or more substances in a mixture by measuring the concentration-dependent molecule-specific extinction.

BACKGROUND OF THE INVENTION

Nondispersive photometers for determining the concentration of a substance in a mixture are widely known and used for a great variety of measuring tasks. Thus, commercial medical measuring instruments for determining CO₂ content in tidal air, so-called capnometers, are based on this principle. These devices evaluate the attenuation of introduced infrared radiation at the wavelength of 4.26 micrometers characteristic of CO₂ according to Lambert-Beer's law

$$I = I_0 \exp [-kCL]$$

where

- I: Detected intensity
- I₀: Irradiated intensity
- k: Specific extinction coefficient
- C: Concentration
- L: Optical path length

as a measure of the CO₂ concentration present in the sample.

In the simplest form, nondispersive photometers work according to a single-beam method (See EP 0 794 423 A1).

IR radiation having an intensity assumed to be constant is passed from a radiation source through the volume penetrated by the sample under testing and measured therebehind for its intensity. The measurement

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